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1. Scope:

This procedure establishes the requirements for the measurement of an 8cm Dipole coil azimuthal size. The deviation of the coil azimuthal size from the design value is determined to confirm the correct coil size and to check that the range of precompression will be correct during collaring. The procedure to measure the coil size is performed at preset positions along the longitudinal length of the coil as defined in Fig. 1.

1.1 Definition:

Coil Size - The azimuthal size is from 0.004 in. below the midplane to the pole surface as shown in Fig. 2, and is measured and recorded as deviations in thousandths of an inch from a standard coil size which matches the magnetic coil design.

2. Applicable Documents:

GAC Dwg. 120100007-SPM	8cm Dipole Coil Compression Gauge Assembly
RHIC-MAG-Q-1004	Discrepancy Reporting Procedure

3. Requirements:

3.1 Material/Equipment

LVDT With Digital Readout Meter	RDP Electrosense, Inc. Probe D5/40G8 Meter E525-115-AC-O-0 or BNL approved equivalent
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Personal Computer

3.2 **Safety Precautions:**

- 3.2.1 Proper eye protection (safety glasses, goggles) shall be worn while the coil is being measured.
- 3.2.2 All guards and barriers must be in place.
- 3.2.3 The technicians shall be qualified in the operation of hydraulic equipment.

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### 3.3 Measurement Procedure

#### 3.3.1 Calibration

- 3.3.1.1 Place coil reference standards in their proper orientations (as marked on each part) against each standard shim. Red right/Green left.
- 3.3.1.2 Place shims on the top surfaces of the reference standards .010" right/.009" left.

#### **CAUTION**

**The next step will cause the Compression Fixture to move – make sure area is clear of personnel and equipment prior to proceeding.**

- 3.3.1.3 Pull back the ENERPAC lever to the pressure release position. Turn "ON" the hydraulic pump (switch located on the read out console). Push lever forward past neutral to the pressure applied position. The hydraulic pressure is set at 8000 PSIG. If necessary, adjust the pressure at the pump using the pressure relief valve.

#### **NOTE**

**Hydraulic pressure of 8000 PSIG results in a coil stress of 10,000 PSI.**

- 3.3.1.4 Using the LVDT Digital Readout Meter, zero both LVDT's by pressing "ZERO" and "MODE 1" (#1 LVDT) simultaneously, then press "ZERO" and "MODE 2" (#2 LVDT) simultaneously.

#### **NOTE**

**Remove the coil stands to allow the coil compression fixture to pass. Replace the stands when the fixture is clear of stand mounts.**

- 3.3.1.5 Release the hydraulic pressure. Repeat the compression cycle to make certain the meter reading returns to zero within 0.0003 in. Release the hydraulic pressure. Add 0.003 in. thick shims, from the shim assortment, to the standard shims. The meter readings should be  $.003 \pm .0003$  in. If not, repeat the calibration procedure (Sect. 3.3.1).
- 3.3.1.6 Remove the coil reference standards and shims. Locate the coil in the compression fixture at the initial measuring position. (See Fig. 1). Be sure the coil is properly cradled.

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3.3.2 Azimuthal Size Measurement

3.3.2.1 Apply 8000 PSIG hydraulic pressure.

3.3.2.2 With the 8000 PSIG applied, when the meter readings are stabilized at  $0 \pm .005$  in., enter the required data into the traveler.

3.3.2.3 Close the hydraulic valve to release the hydraulic pressure.

3.3.2.4 Repeat steps 3.3.2.1 to 3.3.2.3 for the remaining measurement positions as shown on Fig. 1.

3.3.3 Check Calibration & Print Data Sheets

3.3.3.1 After completion of all measurements along the coil, recheck the fixture calibration. (Section 3.3.1) If the calibration does not check out, the coil should be re-measured after the calibration problem is corrected.

3.3.3.2 Print out coil size data sheets and attach to the traveler.

3.3.3.3 Save all data in the magnet database.

4. Quality Assurance Provisions:

4.1 Insure all inspection and test operations have been verified and signed on the production traveler by the cognizant operator.

4.2 Calibration

Verify the calibration for the following equipment is current:

Master Coil Segments  
Hydraulic Pressure Gauge

4.3 All discrepancies shall be reported in accordance with RHIC-MAG-Q-1004.

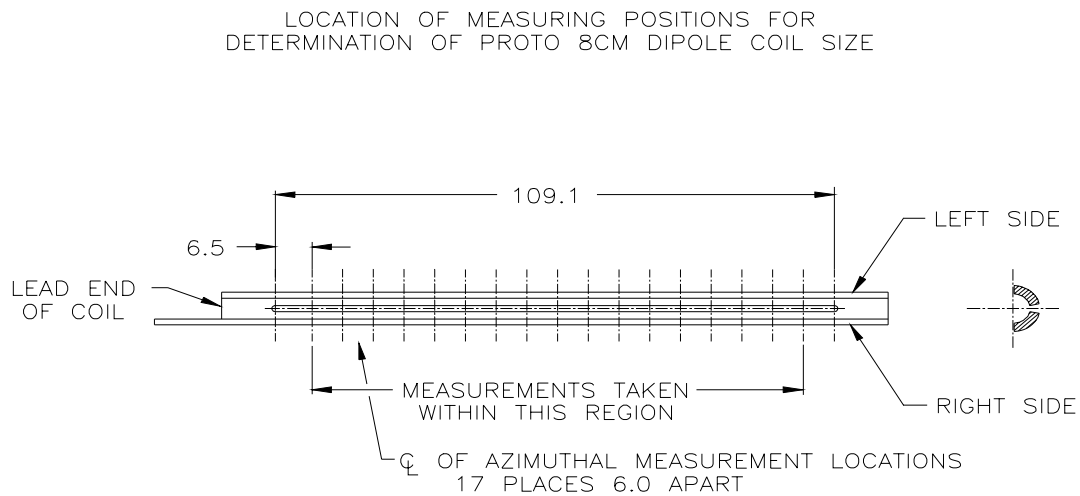
5. Preparation for Delivery:

N/A

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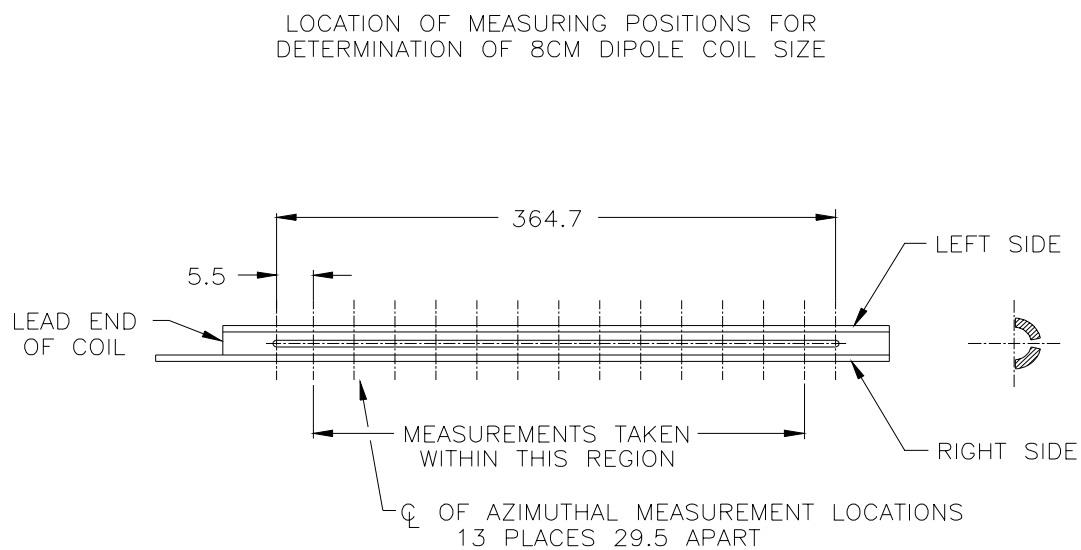
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DIMENSIONS IN INCHES

FIGURE 1A



DIMENSIONS IN INCHES

FIGURE 1B

jsazim1b

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DIPOLE COIL CROSS-SECTION  
DEFINITION OF COIL AZIMUTHAL SIZE

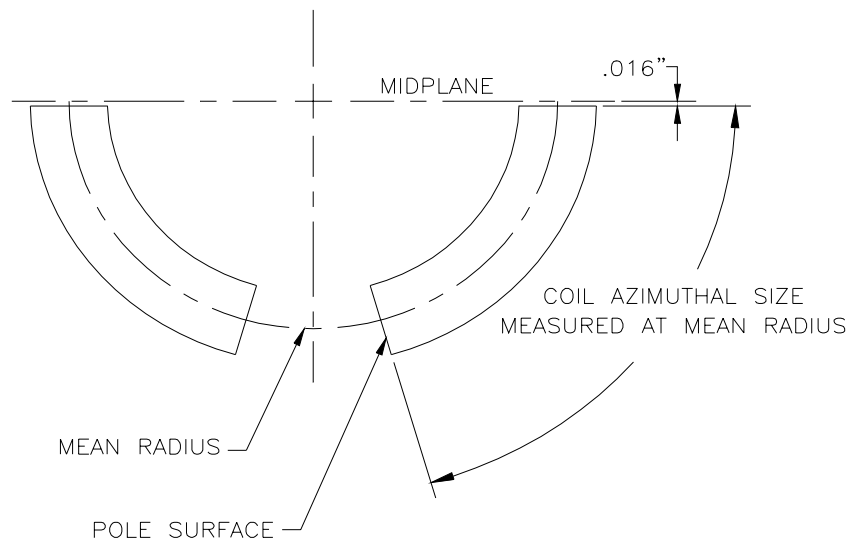


FIGURE 2

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